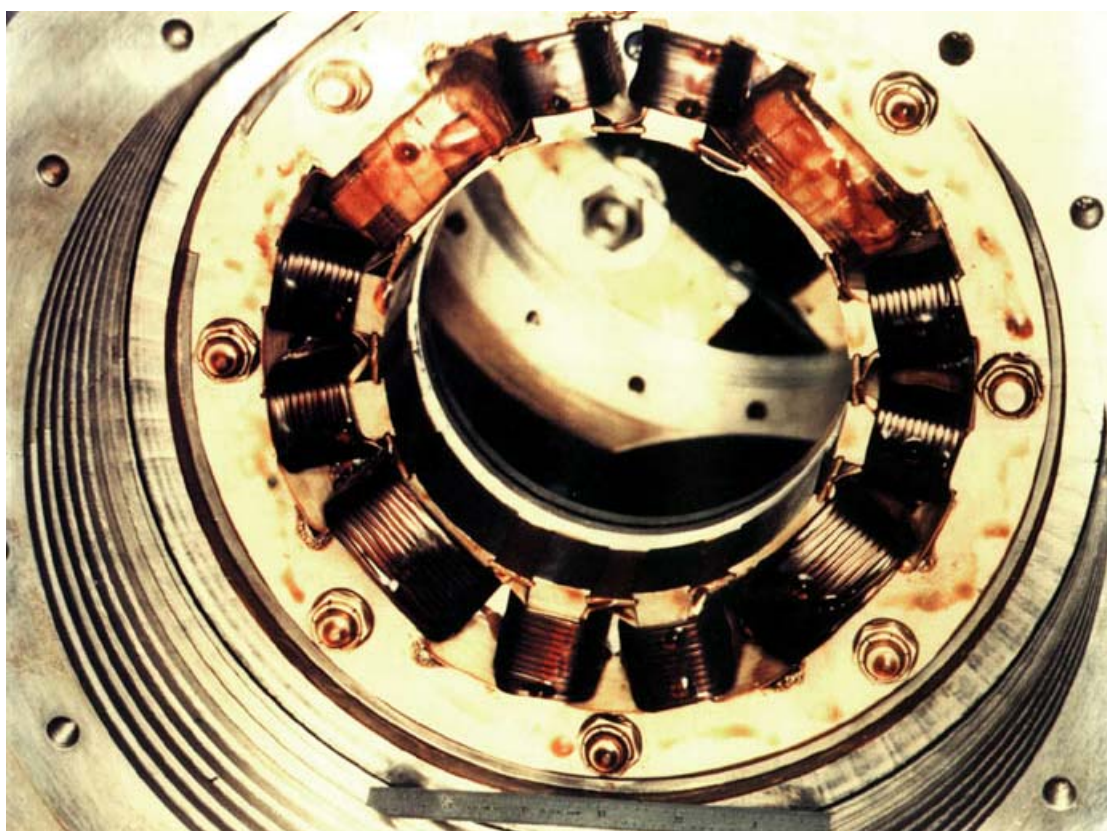




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Science and Technology for Tomorrow's Aerospace Forces

Success Story

Magnetic Bearing Demonstrated in Advanced Turbine Engine Gas Generator



Payoff

A magnetic bearing does not require conventional liquid lubrication. This allows elimination of the engine lubrication system including pumps, reservoir and plumbing. In addition to significant weight savings (10-15% reduction in engine weight if the bearing is combined with the internal starter generator), magnetic bearings will also result in reduced maintenance and lower parts count.

Accomplishment

The first time in jet engine history, the rotor shaft connecting the compressor to the turbine of an advanced demonstrator core engine is magnetically levitated in lieu of employing conventional ball and roller bearings. This magnetic bearing, developed under a program sponsored by Wright Laboratory's Aero Propulsion and Power Directorate and the Navy, as a part of the joint DOD, ARPA, NASA and Industry Integrated High Performance Turbine Engine Technology (IHPTET) initiative, performed flawlessly during a 25 hour test in an advanced

demonstrator core engine.

Background

The demonstration of this innovative concept was conducted at Pratt and Whitney, East Hartford CT, in and Advanced Turbine Engine Gas Generator (ATEGG) and provided critical data necessary for the application of the technology in achievement of the final Phase II goals of the IHPTET initiative. Follow-on tests of the concept will be performed in an advanced dual spool test rig which stimulates the operation of actual gas turbine engine. Further improvements to the magnetic bearing will include the development of higher temperature magnetic materials, Lighter weight power packages, and greater thermal capability.



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Additional information

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